Remarks

Entry of this amendment, reconsideration of the application (as amended), and allowance of all pending claims are respectfully requested. Claims 50-53, 56, 57, 59, 61-63, 66-69, 72-74, 76-81, 84-86 & 88-90 remain pending.

By this paper, the specification and independent claims 50, 59, 66, 74, 78 & 86 are amended to specify that the distributed computing environment is a *shared nothing* distributed computing environment. Support for this amendment can be found throughout the application as filed. For example, the figures accompanying the application illustrate a system wherein there is no shared device employed by the nodes of the computing environment. Further, the shared nothing distributed computing environment is expressly supported by the co-filed and incorporated U.S. patent application (Serial No. 09/583,784) entitled "Method, System and Program Products for Recovering from Failures within a Shared Nothing Distributed Computing Environment", which issued on March 29, 2005 as United States Letters Patent No. 6,873,987.

Additionally, the subject matter of canceled dependent claims 54 & 55, 70 & 71, and 82 & 83 is incorporated into the respective independent claims 50, 66 & 78. Also, the subject matter of canceled dependent claims 60, 75 & 87 is added to the respective independent claims 59, 74 & 86. Thus, no new matter is added to the application by any amendment presented herewith.

In the Office Action of March 29, 2006, claims 50-57, 59-63 & 66-90 were rejected under 35 U.S.C. §102(e) as being anticipated by Snaman, Jr., et al. (U.S. Patent No. 6,243,744 B1; hereinafter Snaman). This rejection is respectfully, but most strenuously, traversed to any extent deemed applicable to the claims presented herewith and reconsideration thereof is requested.

Applicants' invention is directed to managing processing groups of a *shared nothing* distributed computing environment. In one aspect, Applicants' invention is directed to a protocol used to join a prospective member to a processing group. As one example, the protocol is used to join a prospective member to an active processing group. The join protocol includes various steps taken to ensure configuration consistency within the shared nothing distributed

computing environment. Specifically, a sequence number is used throughout the join protocol to control whether a prospective member joins the group and to ensure configuration consistency within the shared nothing distributed computing environment.

As one particular example, Applicants claim a method of managing processing groups of a shared nothing computing environment (e.g., claim 50). The method includes:

- requesting via a request by a prospective member to join a processing group *of a shared nothing distributed computing environment*, the request including a sequence number indicating a version of the processing group;
- determining whether the prospective member can join the processing group, the determining employing the sequence number, wherein the determining includes comparing by the prospective member the sequence number in the request with a current group sequence number to determine if the join of the prospective member to the processing group should continue; and
- joining the processing group by the prospective member, in response at least in part to the determining indicating that the prospective member can join the processing group, wherein the joining includes automatically reinitializing state of the prospective member responsive to the comparing indicating that the sequence number in the request is less than the current group sequence number, *the reinitializing making a state of the prospective member consistent with a state of an existing member of the processing group*, and thereafter, proceeding with the joining by the prospective member.

It is well settled that there is no anticipation of a claim unless a single prior art reference discloses: (1) all the same elements of the claimed invention; (2) found in the same situation as the claimed invention; (3) united in the same way as the claimed invention; and (4) in order to perform the identical function as the claimed invention. In this instance, Snaman fails to disclose various aspects of Applicants' invention as recited in the independent claims presented, and as a result, does not anticipate (or even render obvious) Applicants' invention.

Snaman describes a technique for sharing a resource among a cluster of devices in a computer network. As shown in FIGS. 1A-1E & 4A-4G, Snaman discloses a computing environment wherein *a quorum disk* is employed in forming a cluster by voting devices attempting to reach a quorum. The *quorum disk* described by Snaman is a non-processing voting device that *is shared by the other nodes of the environment*. Because the quorum disk is shared, the computing environment of Snaman is other than a shared nothing computing environment, as recited in the independent claims presented herewith.

In addition to FIGS. 1A-1E & 4A-4G of Snaman requiring the presence of the shared quorum disk, the join protocol described therein (for example, at column 13, lines 1-22) relies upon the existence of the shared quorum disk. Thus, Applicants respectfully submit that the teachings of Snaman would not apply to a shared nothing distributed computing environment such as recited by Applicants. Applicants' approach to managing the processing of groups does not rely upon any shared device, such as a quorum disk, as required by Snaman.

Still further, the independent claims presented recite automatically reinitializing state of the prospective member responsive to the comparing indicating that the sequence number in the request is less than the current group sequence number. This concept of reinitializing includes making a state of the prospective member consistent with the state of an existing member of the processing group. Again, this facility is implemented within a shared nothing distributed computing environment. With respect to this language (from dependent claims 54, 70, 82, etc.), the Office Action references column 6, lines 65-67 & column 7, lines 61-67 of Snaman. However, a careful reading of this material fails to uncover any discussion of *reinitializing state* of the prospective member.

The material referenced in Snaman refers to a running state and re-entering of a running state from a hanging state. However, transitioning from a hanging state to a running state does not equate to reinitializing state of a prospective member as the term would be understood by those skilled in the art. Reinitializing refers to specific functionality which is distinct from transitioning from a hanging state to a running state. Reinitialization is employed in Applicants' invention when the prospective member has an older configuration than the processing group. After the reinitialization, including downloading of the correct state information, then the prospective member is allowed to continue to join the processing group. Again, all this happens within the confines of a shared nothing distributed computing environment. In Snaman, the shared quorum disk is essential to the processing approach presented. If sequence numbers do not agree in Snaman, then the quorum disk is the utmost authority and distributes the configuration information when needed. No such shared entity is employed by the protocol presented in Applicants' recited invention.

Further, one skilled in the art would not have modified the teachings of Snaman so as to remove the shared quorum disk. Snaman relies on the existence of the shared device for the clustering protocol described therein. The quorum disk in Snaman is critical to situations in which no cluster has a majority, and the quorum disk provides the configuration information. Thus, once a processing node arrives at the quorum disk, the configuration can be obtained from the quorum disk. Without the quorum disk, the Snaman protocol would be unworkable.

For at least the above-noted reasons, the independent claims presented herewith are believed to patentably distinguish over the applied art. As such, reconsideration and withdrawal of the rejection is respectfully requested.

The dependent claims are believed allowable for the same reasons as the independent claims, as well as for their own additional characterizations. For example, dependent claims 52, 68 & 80 recite quiescing activity that may effect the state prior to the updating. The term "quiescing" is a term of art which refers to the gradual quieting of a system or network. Quiescing occurs when a signal is sent to stop processing, and then a period of time passes while processes (gracefully) discontinue processing. The processes are essentially allowed to save their current state and exit voluntarily. In Snaman, column 13, lines 36-39, it is noted that Snaman presents a method and apparatus for stopping a partitioned cluster such that processing operations are not performed which would destroy cluster information on a shared resource. As explained at column 12, line 62+, Snaman stops by crashing the cluster to remove any possibility of performing data processing operations that would destroy cluster information on the shared resource. This crashing of the cluster is clearly not an analogous to Applicants' recited quiescing activity that may effect state prior to the updating. The two are distinct functions, and one does not suggest the other. Because Snaman is a quorum disk based approach, Snaman cannot risk data corruption, and the cluster must crash. In contrast, Applicants' invention is not quorum disk based (i.e., is a shared nothing based protocol), and the processes are allowed to quiesce voluntarily.

In view of the above, Applicants respectfully request issuance of an indication of allowance for all pending claims.

Should the Examiner wish to discuss this application with Applicants' undersigned attorney, the Examiner is invited to contact their representative at the below-listed telephone number.

Respectfully submitted,

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